We claim:

1. A method of *in-situ* cleaning an inductively coupled plasma reaction chamber, the method comprising introducing remotely formed, preselected activated reactant species into the reaction chamber.

2. A method of *in-situ* cleaning an inductively coupled plasma reaction chamber, the method comprising introducing gases which contain preselected reactant species into the reaction chamber.

3. A method for plasma enhanced fabrication of a semiconductor substrate in an inductively coupled plasma reaction chamber, said chamber having an inside surface, the method comprising the steps of:

contacting the substrate with a plasma containing preselected reactant species for a preselected fabrication step;

removing the substrate from the reaction chamber after the fabrication step;

removing deposited material *in-situ* from the inside surface of the inductively coupled plasma reaction chamber by introducing remotely formed, preselected activated reactant species into the reaction chamber.

4. The method of Claim 3 wherein the preselected fabrication step is plasma enhanced sputtering.

5. The method of Claim 3 wherein the preselected fabrication step is plasma enhanced etching.

6. The method of Claim 3 wherein the preselected fabrication step is plasma enhanced chemical vapor deposition.

7. The method of Claim 3 wherein the plasma is a high density plasma.

8. A method for plasma enhanced fabrication of a semiconductor substrate in an inductively coupled plasma reaction chamber, said chamber having an inside surface, the method comprising the steps of:

contacting the substrate with a plasma containing preselected reactant species for a preselected fabrication step;

removing the substrate from the reaction chamber after the fabrication step;

removing deposited material *in-situ* from the inside surface of the inductively coupled plasma reaction chamber by introducing gases which contain preselected reactant species into the reaction chamber.

9. The method of Claim 8 wherein the preselected fabrication step is plasma enhanced sputtering.

10. The method of Claim 8 wherein the preselected fabrication step is plasma enhanced etching.

11. The method of Claim 8 wherein the preselected fabrication step is plasma enhanced chemical vapor deposition.

12. The method of Claim 8 wherein the plasma is a high density plasma.

13. A method for PECVD deposition of metal films on a substrate in an inductively coupled (IC) plasma enhanced chemical vapor deposition (PECVD) reactor comprising:

placing the substrate in the inductively coupled PECVD reaction chamber having an inside and an outside;

maintaining the reaction chamber under vacuum pressure;

introducing at least a metal precursor deposition gas into the reaction chamber for metal deposition on the substrate;

generating a plasma from the gas within the reaction chamber using a power source inductively coupled to the reaction chamber;

removing the substrate from reaction chamber; and

in-situ removing deposited material from the inside of the chamber to remove any blocking of the inductive power couple to the reaction chamber.

14. The method of Claim 13 wherein the plasma generated in the reaction chamber is a high density plasma.

15. The method of Claim 13 wherein the *in-situ* removing of material is accomplished by introducing into the reaction chamber a chemical species generated in a remotely formed plasma for etching the material.

16. The method of Claim 13 wherein the *in-situ* removing of material is accomplished by introducing into the reaction chamber remotely formed activated reactant species for etching the material.

17. The method of Claim 13 wherein the *in-situ* removing of material is accomplished by introducing into the reaction chamber gases for etching the material.

18. The method of Claim 13 wherein the vacuum pressure maintained in the reaction chamber is in the range of 1 to 10 mtorr.

19. The method of Claim 14 wherein the vacuum pressure maintained in the reaction chamber is in the range of 1 to 10 mtorr.

20. The method of Claim 15 wherein the vacuum pressure maintained in the reaction chamber is in the range of 1 to 10 mtorr.

21. The method of Claim 16 wherein the vacuum pressure maintained in the reaction chamber is in the range of 1 to 10 mtorr.

22. The method of Claim 17 wherein the vacuum pressure maintained in the reaction chamber is in the range of 1 to 10 mtorr.

23. A semiconductor device produced by the process comprising the steps of:

placing a substrate in an inductively coupled chemical vapor deposition chamber having an inside and an outside;

maintaining the chamber under vacuum pressure;

introducing a metal precursor deposition gas and a carrier gas into the chamber for metal deposition on the substrate;

generating a plasma from the gases in the chamber using a power source inductively coupled to the reaction chamber;

removing the substrate from reaction chamber; and

in-situ removing of deposited material from the inside of the chamber to remove any blocking of the inductive power couple to the reaction chamber.

24. The device of Claim 23 wherein the *in-situ* removing of material is accomplished by introducing into the reaction chamber a chemical species generated in a remotely formed plasma for etching the material.

25. The method of Claim 23 wherein the *in-situ* removing of material is accomplished by introducing into the reaction chamber remotely formed activated reactant species for etching the material.

26. The device of Claim 23 wherein the *in-situ* removing of material is accomplished by introducing into the reaction chamber gases for etching the material.

27. A method of forming a metal layer on a semiconductor wafer, using an inductively coupled, plasma enhanced chemical vapor deposition chamber, the method comprising the steps of:

forming a plasma containing a metal precursor deposition gas; exposing the wafer to the plasma sufficiently to deposit a metal layer thereon; removing the wafer from the chamber and *in-situ* cleaning the chamber to remove any material blocking the inductive couple to the chamber.

28. The method of Claim 27 wherein the *in-situ* removing of material from the chamber is accomplished by introducing into the reaction chamber a remotely formed plasma containing chemicals for etching the material.

29. The method of Claim 27 wherein the *in-situ* removing of material from the chamber is accomplished by introducing into the reaction chamber gases for etching the material.

30. A method of altering a substantially planar surface on a semiconductor wafer, using an inductively coupled, plasma chamber, the method comprising the steps of:

forming a plasma containing a reactant conductive material gas; exposing the wafer to the plasma sufficiently to alter a surface layer thereon; removing the wafer from the chamber and *in-situ* cleaning the chamber to remove any material blocking the inductive couple to the chamber.

31. The method of Claim 30 wherein the *in-situ* removing of material from the chamber is accomplished by introducing into the reaction chamber a remotely formed plasma containing chemicals for etching the material.

32. The method of Claim 30 wherein the *in-situ* removing of material from the chamber is accomplished by introducing into the reaction chamber gases for etching the material.

33. A method of making a semiconductor device, comprising the steps of:

exposing a substrate to products formed in an inductively coupled plasma chamber through the interaction of a noble gas plasma and a reactant-species-forming compound to alter a metal layer on at least a portion of the substrate, *in-situ* removal of deposited material from the chamber.

34. The method of Claim 33 wherein the *in-situ* removing of material is accomplished by introducing into the reaction chamber a chemical species generated in a remotely formed plasma for etching the material.

35. The method of Claim 33 wherein the *in-situ* removing of material is accomplished by introducing into the reaction chamber remotely formed activated reactant species for etching the material.

36. The method of Claim 33 wherein the *in-situ* removing of material from the chamber is accomplished by introducing into the reaction chamber gases for etching the material.

37. A method of making a semiconductor device, comprising the steps of:
exposing a substrate to products formed in an inductively coupled plasma chamber through the interaction of a noble gas plasma and reactant-species-forming compound to alter a surface on at least a portion of the substrate, *in-situ* removal of deposited material from the chamber.

38. The method of Claim 37 wherein the *in-situ* removing of material is accomplished by introducing into the reaction chamber a chemical species generated in a remotely formed plasma for etching the material.

39. The method of Claim 37 wherein the *in-situ* removing of material is accomplished by introducing into the reaction chamber remotely formed activated reactant species for etching the material.

40. The method of Claim 37 wherein the *in-situ* removing of material from the chamber is accomplished by introducing into the reaction chamber gases for etching the material.

add B2

B1